IN THE CLAIMS

1. (Currently amended) In a data storage system, a method for detecting errors in data to be stored within the data storage system, the method comprising the steps of:

receiving the data at the data storage system by (i) receiving a portion of data, (ii) generating data portion error checking information for the portion of data, and (iii) repeating the steps of receiving a portion of data and generating data portion error checking information until all portions of data are received that constitute an application data block upon which an application that originates the application data block has computed application error checking information, the data portion error checking information being an N-byte checksum value generated in the data storage system for each portion of data that is received, the application error checking information being an M-byte checksum value computed by the application on all portions of data that constitute the application data block;

receiving the application error checking information at the data storage system;

generating data storage error checking information on the data by computing an N-byte value for the data storage error checking information by performing an exclusive-or on all N-byte checksum values for all portions of data that are received that constitute the application data block, wherein N is different from M such that the format of the application error checking information is incompatible with the format of the data storage error checking information and cannot be compared therewith;

converting each application error checking information M-byte value into a corresponding N-byte value such that the application error checking information is in a compatible format with and can be compared with the data storage error checking information;

comparing the application error checking information, in a-the format that

is compatible with the data storage error checking information, to the data

storage error checking information to determine if the data contains an error upon

receipt;

if the data contains an error, providing an indication of the error; and

if the data does not contain an error, storing the data within the data

storage system.

2 -4. (Cancelled)

5. (Not entered) The method of claim 4-1 wherein the application error checking

information is embedded within at least one portion of data that is received, and

wherein the step of converting includes the step of:

extracting the application error checking information from that at least one

portion of data in which the application error checking information is embedded.

6-8. (Cancelled)

9. (Original) The method of claim 1 further including the steps of:

receiving a configuration command at the data storage system, the

configuration command indicating to the data storage system at least one of:

i) a designation of a portion of storage within the data storage system for

storing the data processed by the steps of receiving, generating and comparing;

ii) an indication of areas in the portion of storage that do not contain data

including application error checking information;

iii) an indication of a location of application error checking information

within an application data block that comprises the data that is received; and

iv) an indication of a size of the application data block.

10. (Original) The method of claim 9 further including the step of:

in response to receiving the configuration command, designating the portion of storage within the data storage system for storing the data processed by the steps of receiving, generating and comparing, such that data received that is to be stored in the designated portion of storage is subjected to the steps of generating data storage error checking information and comparing the application error checking information to the data storage error checking, and such that an error in the data received that is to be stored in the designated portion of storage is detected upon receipt of the data by the data storage system.

11. (Original) The method of claim 9 further including the step of:

in response to receiving the configuration command, the step of generating data storage error checking information on the data received in the data storage system excludes generating data storage error checking information on data that is to be stored within the portion of storage that does not contain data including application error checking information.

12. (Original) The method of claim 1 wherein:

the data is database data generated by a database application;

the application error checking information is software generated checksum information generated on portions of the database data by the database application and is embedded within the database data received; and

the step of generating data storage error checking information applies, within the data storage system, a data storage error checking checksum algorithm to the database data received that is compatible with a software application error checking algorithm used by the database application to create the application error checking information, such that the data storage error checking algorithm produces a data storage error checking information result that the step of comparing can use to compatibly compare with the application error checking information to determine if the data received contains an error.

13. (Previously presented) The method of claim 12 wherein the application error checking information is an embedded checksum received with the database data at a predetermined offset in an application data block.

14. (Original) The method of claim 1, wherein if the step of comparing determines that the data received in the data storage system contains an error, the step of providing an indication of the error includes providing, to a software application that originated the data, a rejection of at least one input-output request performed to receive the data in the data storage system.

15. (Currently Amended) A data storage system comprising:

an interface receiving data to be stored in the data storage system and receiving application error checking information, the interface receiving the data by receiving a portion of the data, the application error checking information being an M-byte checksum value computed by the application on all portions of data that constitute an application data block;

an error detection component including a data portion error checking information generator coupled to the interface, a data storage error checking information generator coupled to the data portion error checking information generator, and an application error checking information extractor coupled to the interface;

at least one storage device; and

an interconnection mechanism coupling the interface, the error detection component and the at least one storage device;

wherein the error detection component operates in the data storage system to detect errors in the data by:

generating, by the data portion error checking information generator, data portion error checking information for each portion of data received by the interface, the data portion error checking information being

an N-byte checksum value generated by the data portion error checking information generator for each portion of data that is received by the interface;

          repeating, by the interface and the data portion error checking information generator, the operations of i) receiving a portion of the data and ii) generating the data portion error checking information until all portions of the data are received by the interface that constitute the application data block;

generating data storage error checking information on the data by computing, by the data storage error checking information generator, an N-byte value for the data storage error checking information by performing an exclusive-or on all data portion error checking information N-byte checksum values for all portions of data that are received by the interface that comprise the application data block, wherein N is different from M such that the format of the application error checking information is incompatible with the format of the data storage error checking information and cannot be compared therewith;

          converting, by the application error checking information extractor, the application error checking information M-byte value into an N-byte value such the application error checking information is in a compatible format with and can be compared with the data storage error checking information;

comparing the application error checking information, in a the format that is compatible with the data storage error checking information, to the data storage error checking information to determine if the data contains an error upon receipt;

if the data contains an error, providing an indication of the error; and

if the data does not contain an error, storing the data within the at least one storage device in the data storage system.

16 - 18. (Cancelled)

19. (Not entered) The data storage system of claim ~~18~~ 15 wherein:

the application error checking information is embedded within at least one portion of data that is received by the interface and

when the application error checking information extractor converts the application error checking information, the application error checking information extractor extracts the application error checking information from at least one portion of data which the application error checking information is embedded.

20 – 22. (Cancelled)

23. (Original) The data storage system of claim 15 wherein the interface receives a configuration command indicating to the data storage system at least one of:

i) a designation of a portion of storage within that at least one storage device in the data storage system for storing the data processed by the steps of receiving, generating and comparing;

ii) an indication of areas in the portions of storage that do not contain data including application error checking information;

iii) an indication of a location of application error checking information within an application data block that comprises the data that is received; and

iv) an indication of a size of the application data block.

24. (Original) The data storage system of claim 23 wherein the interface, in response to receiving the configuration command, causes the data storage system to designate the portion of storage within the data storage system for storing the data processed by the error detection component, such that data received by the interface that is to be stored in the designated portion of storage

is subject to processing by the error detection component, and such that an error in the data received that is to be stored in the designated portion of storage is detected upon by the error detection component upon receipt of the data by the data storage system.

25. (Previously presented) The data storage system of claim 23 wherein, in response to receiving the configuration command, the error detection component generates data storage error checking information on the data received in the data storage system excludes the data that is to be stored within the portion of storage that does not contain data including application error checking information.

26. (Original) The data storage system of claim 15 wherein:

the data is database data generated by a database application;

the application error checking information is software generated checksum information generated on portions of the database data by the database application and is embedded within the database data received; and

the error detection component applies a data storage error checking checksum algorithm to the database data that is compatible with a software application error checking algorithm used by the database application to create the application error checking information, such that the data storage error checking algorithm produces a data storage error checking information result that the error detection component can use to compatibly compare with the application error checking information to determine if the data received contains an error.

27. (Previously presented) The data storage system of claim 26 wherein the application error checking information is an embedded checksum received by the error detection component with the database data at a predetermined offset in an application data block.

28. (Previously presented) The data storage system of claim 15, wherein if the error detection component determines in the comparing operation that the data received in the data storage system contains an error, the error detection component provides an indication of the error to a software application that originated the data and the interface rejects at least one input-output request performed to receive the data in the data storage system.

29. (Currently Amended) A computer program product having a computer-readable medium including computer program logic encoded thereon that when performed on a data storage system, causes the data storage system to detect error in data to be stored in the data storage system, and wherein when the computer program logic is performed on at least one processor in the data storage system, the computer program logic causes the at least one processor to perform the operations of:

receiving the data at the data storage system <u>by (i) receiving a portion of data, (ii) generating data portion error checking information for the portion of data, and (iii) repeating the steps of receiving a portion of data and generating data portion error checking information until all portions of data are received that constitute an application data block upon which an application that originates the application data block has computed application error checking information, the data portion error checking information being an N-byte checksum value generated in the data storage system for each portion of data that is received, the application error checking information being an M-byte checksum value computed by the application on all portions of data that constitute the application data block</u>;

receiving <u>the</u> application error checking information at the data storage system;

generating data storage error checking information on the data <u>by computing an N-byte value for the data storage error checking information by</u>

<u>performing an exclusive-or on all N-byte checksum values for all portions of data</u> <u>that are received that constitute the application data block, wherein N is different</u> <u>from M such that the format of the application error checking information is</u> <u>incompatible with the format of the data storage error checking information and</u> <u>cannot be compared therewith;</u>

<u>   converting each application error checking information M-byte value into a</u> <u>corresponding N-byte value such that the application error checking information</u> <u>is in a compatible format with and can be compared with the data storage error</u> <u>checking information;</u>

comparing the application error checking information, in a-<u>the</u> format that is compatible with the data storage error checking information, to the data storage error checking information to determine if the data contains an error upon receipt;

if the data contains an error, providing an indication of the error; and

if the data does not contain an error, storing the data within the data storage system.

30 - 31. (Cancelled)

32. (Original) The computer program product of claim 29 wherein the computer program logic, when performed on the at least one processor, causes the at least one processor to further perform the step of:

receiving a configuration command at the data storage system, the configuration command indicating to the data storage system at least one of:

i) a designation of a portion of storage within the data storage system for storing the data processed by the steps of receiving, generating and comparing;

ii) an indication of areas in the portion of storage that do not contain data including application error checking information;

iii) an indication of a location of application error checking information within an application data block that comprises the data that is received; and

iv) an indication of a size of the application data block.

33. (Currently amended) A data storage system comprising:

an interface including a means for receiving data to be stored in the data storage system and a means for receiving application error checking information<u>,</u> <u>the interface receiving the data by receiving a portion of the data, the application error checking information being an M-byte checksum value computed by the application on all portions of data that constitute an application data block</u>;

an error detection component <u>including a data portion error checking information generator coupled to the interface, a data storage error checking information generator coupled to the data portion error checking information generator, and an application error checking information extractor coupled to the interface</u>;

at least one storage device; and

an interconnection mechanism coupling the interface, the error detection component and the at least one storage device;

wherein the error detection component operates in the data storage system to detect errors in the data and includes:

<u>   means for generating, by the data portion error checking information generator, data portion error checking information for each portion of data received by the interface, the data portion error checking information being an N-byte checksum value generated by the data portion error checking information generator for each portion of data that is received by the interface;</u>

<u>   means for repeating, by the interface and the data portion error checking information generator, the operations of i) receiving a portion of the data and ii) generating the data portion error checking information until all portions of the data are received by the interface that constitute the application data block;</u>

means for generating data storage error checking information on the data by computing, by the data storage error checking information generator, an N-byte value for the data storage error checking information by performing an exclusive-or on all data portion error checking information N-byte checksum values for all portions of data that are received by the interface that comprise the application data block, wherein N is different from M such that the format of the application error checking information is incompatible with the format of the data portion error checking information and cannot be compared therewith;

_____ means for converting, by the application error checking information extractor, the application error checking information M-byte value into an N-byte value such the application error checking information is in a compatible format with and can be compared with the data storage error checking information;

means for comparing the application error checking information, in a-the format that is compatible with the data storage error checking information, to the data storage error checking information to determine if the data contains an error upon receipt;

means for providing an error indication if the data contains an error; and

means for storing the data within the at least one storage device in the data storage system if the data does not contain an error.

34. (Currently amended) In a data storage system, a method for detecting errors in data to be stored within the data storage system, the method comprising the steps of:

receiving the data at the data storage system, the data being received as multiple portions of data that constitute an application data block;

generating data portion error checking information for each portion of data in the application data block, the data portion error checking information having an N-byte checksum format;

receiving application error checking information at the data storage system, the application error checking information having an M-byte checksum format;

generating data storage error checking information on the data, the data storage error checking information being generated by combining the data portion error checking information generated for each portion of data that comprises the application data block, the data storage error checking information having an N-byte checksum format, N is different from M such that the format of the application error checking information is incompatible with the format of the data storage error checking information and cannot be compared therewith;

~~determining if the M-byte checksum format of the application error checking information is the same as the N-byte checksum format of the data storage error checking information;~~

~~if the M-byte checksum format of the application error checking information is not the same as the N-byte checksum format of the data storage error checking information,~~ converting the application error checking information into a format that is the same as the format of the data storage error checking information;

comparing the application error checking information, in the format that is compatible with the data storage error checking information, to the data storage error checking information, to determine if the data contains an error upon receipt;

if the data contains an error, providing an indication of the error; and

if the data does not contain an error, storing the data within the data storage system.

35. (Currently amended) A data storage system comprising:

an interface receiving data to be stored in the data storage system and receiving application error checking information, the data being received as multiple portions of data that constitute an application data block; the application error checking information having an M-byte checksum format;

an error detection component;

at least one storage device; and

an interconnection mechanism coupling the interface, the error detection component and the at least one storage device;

wherein the error detection component operates in the data storage system to detect errors in the data by:

generating data portion error checking information for each portion of data in the application data block, the data portion error checking information having an N-byte checksum format;

generating data storage error checking information on the data, the data storage error checking information being generated by combining the data portion error checking information generated for each portion of data that comprises the application data block, the data storage error checking information having an N-byte checksum format, wherein N is different from M such that the format of the application error checking information is incompatible with the format of the data storage error checking information and cannot be compared therewith;

~~determining if the M-byte checksum format of the application error checking information is the same as the N-byte checksum format of the data storage error checking information;~~

~~if the M-byte checksum format of the application error checking information is not the same as the N-byte checksum format of the data storage error checking information,~~ converting the application error checking information into a format that is the same as the format of the data storage error checking information;

comparing the application error checking information, in the format that is compatible with the data storage error checking information, to the data storage error checking information, to determine if the data contains an error upon receipt;

if the data contains an error, providing an indication of the error; and

if the data does not contain an error, storing the data within the data storage system.

36. (New) The method of claim 1 wherein M is an integer multiple of N and wherein converting each application error checking information M-byte value into a corresponding N-byte value comprises combining predetermined bytes of the application error checking information to generate the corresponding N-byte value.

37. (New) The method of claim 36 wherein M is equal to 2N and wherein combining predetermined bytes of the application error checking information comprises performing an exclusive-OR operation between the last M/2 bytes and the first M/2 bytes of the application error checking information.

38. (New) The method of claim 37, wherein N is equal to two.

39. (New) The method of claim 36 wherein combining comprises applying an exclusive-OR function.

40. (New) The data storage system of claim 15 wherein M is an integer multiple of N and wherein converting each application error checking information M-byte value into a corresponding N-byte value comprises combining predetermined bytes of the application error checking information to generate the corresponding N-byte value.

41. (New) The data storage system of claim 39 wherein M is equal to 2N and wherein combining predetermined bytes of the application error checking information comprises performing an exclusive-OR operation between the last M/2 bytes and the first M/2 bytes of the application error checking information.

42. (New) The data storage system of claim 41 wherein N is equal to two.

43. (New) The data storage system of claim 41 wherein combining comprises applying an exclusive-OR function.